UGANDA

Farm mapping increases incomes for tea farmers

To ensure improved operations of a smallholder tea company in Uganda, and boost yields for farmers, an innovative garden geo-referencing project is working to gather local data.

Bob Koigi

In south-western Uganda, where tea cultivation is the mainstay of the local economy, Igara Growers Tea Factory Ltd (IGTF) is providing a guaranteed, year-round market to 7,000 smallholder farmers, 20% of whom are women. The factory receives up to 250 t of fresh leaves on a daily basis, which it transforms into 50 t of tea. In the process, the factory has created 700 local jobs at its two facilities.

To achieve high yields and incomes from tea leaf production, farmers require the timely access of inputs – like fertilisers and agrochemicals – and regular payment from the local factories they supply. In the absence of reliable income, tens of thousands of smallholder farmers often peddle their produce to the highest bidder – a move that is not only against the contract they have with the factory, but also renders farmers vulnerable to insufficient income and unable to afford inputs for the next planting season.

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However, since 1995 when the company was established, IGTF shareholder farmers have been entitled to receive inputs, which they receive on credit and repay at a later date. But as the number of IGTF farmers grew, so too did the challenges. Poor record keeping by IGTF, for instance, meant they did not know the exact number of farmers they were working with and, thus, could not account for all the inputs being distributed to their members. In some cases, family members would often register the same land under different names and claim ownership in order to also receive the inputs. "Record keeping was a serious problem. We didn't have accurate records about the ownership and location of the tea gardens. We weren't sure who was with us and who wasn't, and we realised we needed to strengthen our database," says Onesimus Matsiko, IGTF general manager.

In addition, as demand for fresh tea leaves among processors skyrocketed, farmers would sometimes sell their leaves to competitors after receiving inputs from IGTF, lured by higher prices, which led to them abandoning outstanding IGTF loan repayments. The loan defaulting problem was so severe that, at one point, the company's accumulated debt rose to €214,000; an amount equivalent to how much the company would spend in purchasing all of the inputs to supply their farmers for one season.

Igara Growers Tea Factory Ltd in Uganda has implemented a geo-referencing and farm mapping initiative to profile its farmer members

Farmer profiling for profits

In 2017, with funding from CTA, IGTF implemented an innovative and elaborate geo-referencing and farm mapping initiative to profile all of the farmers supplying IGTF's two factories, as well as those who held shares in the company but were supplying leaves elsewhere. Data on farm location, size and productivity of members' farms were collected.

Profiling started with the training of IGTF staff on data gathering using GPS-enabled tablets and a tailored data gathering application. Gathered data were later analysed at IGTF and spatially analysed using an open source geographic information system. In 5 months, 10 enumerators moved across farms collecting vital data armed with GPS devices and tablets, and each could cover up to eight farmers a day. At the end of the exercise, in addition to information on farm sizes and locations, the enumerators had gathered comprehensive details including alternative sources of farmer income besides tea cultivation, the age of tea bushes, harvesting methods, and causes of crop failures. "It was one of the most elaborate exercises we have ever conducted and part of the success was due to the fact that the enumerators were able to finish their work a month ahead of schedule. To date, we have managed to profile about 4,500 farmers and mapped approximately 5,200 farms," says Hamlus Owoyesiga, IGTF network and systems administrator.

The work of the initiative was complemented by the use of drones under CTA's Eyes in the Sky project, which were used to pilot remote data acquisition over approximately 40 farms. Data were used to diagnose crop health and quantify unutilised areas or count tea bushes within the single gardens. In addition, aerial views of the farms enriched with crop diagnostic maps were used to develop enhanced dossiers farmers could submit to lending institutions for obtaining credit.

The data collected via the profiling exercise has informed IGTF of the exact number of farmers it works with, as well as their farm sizes and locations, which has enabled the company to ensure that the adequate amount of fertiliser is supplied to each farmer. The information gathered has also assisted the company in identifying problems farmers are having in terms of increasing their productivity, and as such, has enabled them to implement useful interventions, such as farmer training.

Farmer profiling means the company can now reach a bigger number of farmers with inputs, advice on improved farming practices and accessing credit facilities, within a short period of time due to data accuracy. It has also reduced input wastage – which occurred through supplying members with too much – and the occurrence of farmers taking advantage of the system because the details for each farmer are saved on the company's data system. Since distributing fertilisers to farmers in ›

› September 2017 – immediately after the introduction of the profiling system – IGTF was able to recover 90% of the cost in credit to farmers by January 2018. The number of farmers supplying the company also considerably increased at the beginning of the initiative – from 2,900 in August to 3,400 by the end of November 2017, and today, there are 7,000 members.

Farmers have welcomed the project, saying they are now increasing yields as timely distribution of inputs in the right quantities has allowed them to enhance their cultivation. "The profiling has done a great job in reviving confidence in the company among farmers, and it has strengthened their identity as shareholders. Many of the farmers who had been supplying other companies with tea during recent years decided to return to our company," says Owoyesiga. "I have 3.5 ha and I now know exactly how much fertiliser I need to use – something I didn't in the past. I used to waste a lot of vital fertiliser," adds local farmer Shem Babushereka who has doubled his yields from 2,000 to 4,000 kg of leaves each month following more precise application of fertiliser.

Credit based on consistency

As a result of the farmer profiling and availability of data on their farm size and produce quantity, the Igara-Buhweju Tea Farmers' Savings and Credit Cooperative Organization (SACCO) was created in October 2017 to offer registered members credit and financial services. The SACCO monitors farmers' amount of produce and extends credit facilities to them based on quantity and consistency in delivery, and charges lower interest rates compared to commercial banks with reduced credit application time and procedures, which has attracted more farmers. In the first week of its operations in October 2017, more than 200 farmers opened accounts with the SACCO. Farmers are also able to get advance payment in case of an emergency by providing a receipt of their latest delivery to the factory.

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"We know that we can trust the data gathered during the profiling exercise, for example, about the size and location of tea gardens, and this helps us to assess the creditworthiness of farmers who come to us for loans," says Lillian Nuwagaba, the SACCO general manager. "Now it is easier for farmers to receive fertiliser and credit, not just from us but also from banks because the information that is recorded can act as collateral," Matsiko adds.

Going forward, the project is looking to increase its use of drones by partnering with data analysis institutions like French-based Airinov. Through such partnerships, IGTF aims to introduce applications that would allow for the precise application of nitrogen and fertiliser to crops, and the identification of tea bushes that need to be replaced in order to increase yields. IGTF also hopes to collaborate with other tea factories in Uganda to roll out the profiling and geo-mapping technology as one way of boosting smallholder productivity for tea – a crop that the government has identified as strategic for export promotion. ■

Farmer profiling creates 'digital passport' for coffee

Behind the growing interest in Ugandan coffee among export markets are the spirited efforts of the Ugandan National Union of Coffee Agribusinesses and Farm Enterprises Limited (NUCAFE), which is also working with CTA to strengthen the commodity's value chain. NUCAFE encourages the uptake of technology among farmers and farmer cooperatives to improve yields and boost the country's coffee export earnings. NUCAFE has approximately 1.5 million farmer members organised into 210 cooperatives who own, on average, 0.2 ha of land. However, the organisation has been struggling with coffee marketing to key export destinations, such as the EU and the Middle East, as buyers demands increasingly require data on traceability and growing conditions.

In 2017, in response to this demand, and with assistance provided by CTA, NUCAFE started running a coffee traceability system, which seeks to map its members' coffee bushes and farms. "Through the use of technology, NUCAFE has created a digital 'passport' to prove the authenticity and origin of the coffee we export, creating an auditable record of the journey behind what we are selling," says Joseph Nkandu, NUCAFE executive director. The traceability system is a database where farmer details are uploaded, such as the type of coffee they are growing, the inputs they are using and how much they earn from the sale of their coffee, to provide a profile for each member. Such innovations have facilitated certification for farmers, such as geographical indication, and have seen farmers exporting to new markets, including Japan and South Korea.

The profiling has attracted new members to NUCAFE, who would also like to boost their yields and increase their chances of certification to access new markets. Bufumbo Organic Coffee Farmers association, for example, decided to join NUCAFE and use the profiling database while applying for organic and UTZ certification – a programme and label for sustainable farming. The association received both certificates and has, since the beginning of 2018, entered a deal with Caffe River in Italy to supply 19.8 t of coffee annually.